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Directed Ecological Mandala Coloring (DEMC): A Bronfenbrenner-Informed Expressive Intervention for Ecological Reflection, Emotional Regulation, and Therapeutic Meaning-Making

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Abstract

Human development is shaped by complex interactions between individuals and their surrounding ecological systems, particularly within contexts of trauma, neurodiversity, psychosocial vulnerability, and emotional development. While mandala-based expressive interventions have demonstrated potential in facilitating emotional regulation, symbolic communication, and reflective meaning-making, existing approaches often lack an explicit ecological framework. The author of this paper proposes Directed Ecological Mandala Coloring (DEMC) as a structured and theoretically grounded expressive intervention integrating the Bronfenbrennerian ecological systems theory with the symbolic and therapeutic structure of mandala art. DEMC intentionally organizes six concentric mandala rings to represent the self-system, microsystem, mesosystem, exosystem, macrosystem, and chronosystem. This structure enables participants to visually

and emotionally explore the environmental influences shaping their identity, relationships, emotions, resilience, and lived experiences. Through guided coloring/drawing, symbolic reflection, and facilitated meaning-making, DEMC seeks to support emotional regulation, ecological self-awareness, trauma externalization, relational understanding, and neurodiversity-affirming therapeutic engagement. This paper outlines the theoretical foundations, intervention structure, facilitation process, and potential educational and psychosocial applications of DEMC. Furthermore, the author discusses the relevance of DEMC within trauma-informed care, educational therapy, counseling, and reflective supervision. The paper concludes by highlighting the need for future empirical research to evaluate the effectiveness of intervention across diverse populations, developmental stages, and cultural contexts.

Keywords: Directed Ecological Mandala Coloring (DEMC), Ecological Systems Theory, Expressive Arts Therapy, Emotional Regulation, Neurodiversity

1. Introduction

Human development does not occur in isolation. Instead, it emerges through continuous interactions between individuals and their multiple ecological environments, which shape their experiences, relationships, identities, and well-being. Developmental theorists (e.g., Jean Piaget, Erik Erikson and Lev Vygotsky) have long emphasized the importance of understanding the reciprocal relationship between the individual and surrounding systems, especially within contexts of adversity, trauma, neurodiversity, and psychosocial vulnerability. Among the most influential perspectives is Urie Bronfenbrenner's ecological systems theory, which conceptualizes human development as occurring within interconnected systems ranging from immediate interpersonal relationships to broader cultural, societal, and historical influences (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2006) ^[1, 2]. This multidimensional understanding of development highlights the dynamic relationship between individuals and their surrounding environments. It is increasingly relevant in contemporary educational, therapeutic, and psychosocial contexts. The Bronfenbrennerian framework is especially useful when working with children, adolescents, and vulnerable populations whose lived experiences are shaped by intersecting relational, social, and environmental factors. For example, practitioners may use approaches such as ecological autopsy (Chia, 2025; Ding, 2025) ^[5, 9] to examine how family relationships, school experiences, community conditions, and broader societal influences contribute to an individual's emotional and behavioral development.

Concurrently, expressive and arts-based interventions have gained growing recognition for their capacity to facilitate emotional expression, self-awareness, trauma processing, and psychological regulation, particularly among individuals who may struggle with verbal communication (Cheng, 2015; Miller & Torkington, 2021; Sahai & Tiwari, 2026) [3, 20, 22]. Mandala-based therapeutic approaches (e.g., mandala drawing and mandala coloring), in particular, have been associated with emotional containment, reduced anxiety, reflective functioning, and symbolic meaning-making due to their circular, structured, and visually organizing nature (Curry & Kasser, 2005; Malchiodi, 2020; Chia, Wong, & Thang, 2026) [7, 19, 6]. Rooted in symbolic traditions and psychological theory, mandalas provide a non-threatening medium through which emotions, relationships, and internal experiences may be externalized in ways that feel psychologically safe and personally meaningful (Jung, 1964; Henderson, Rosen, & Mascaro, 2007; Xie & Wang, 2021) [13, 10, 31]. However, although mandala coloring has frequently been used as a therapeutic or mindfulness-oriented activity, many existing approaches remain relatively unstructured and may not explicitly integrate ecological perspectives on human development.

In response to this conceptual and practical gap, the author of this paper has proposed *Directed Ecological Mandala Coloring* (DEMC) as a structured, guided, and ecologically informed expressive intervention that integrates the Bronfenbrennerian ecological systems theory with the symbolic circular structure of mandala art. DEMC intentionally assigns six concentric mandala rings (see Figure 1) to represent the ecological systems influencing an individual’s development, namely the following: Ring 1-Self or Intrasystem, Ring 2-Microsystem, Ring 3-Mesosystem, Ring 4-Exosystem, Ring 5-Macrosystem, and Ring 6-Chronosystem.

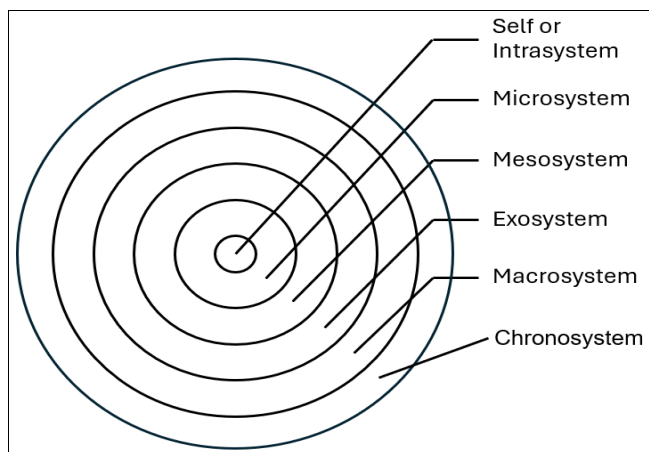


Fig 1: The Six Concentric Mandala Rings of DEMC

The Bronfenbrennerian ecological systems theory proposes that human development is influenced by interconnected environmental systems ranging from immediate personal relationships to broader sociocultural and historical forces. Hence, each of the six concentric rings carries its own symbolic meaning (see Table 1), which corresponds to the respective ecological systems (or ecosystems, for short).

Table 1: Structure of the Six-Ring Mandala

Mandala Ring	Ecological Systems	Symbolic Meanings
Ring 1	Self or Intrasystem	Identity, emotions, body, neurotype, inner experiences
Ring 2	Microsystem	Family, peers, teachers, caregivers
Ring 3	Mesosystem	Interactions between home-school-community
Ring 4	Exosystem	Policies, parents’ workplace, institutions, media
Ring 5	Macrosystem	Culture, religion, social values, societal expectations
Ring 6	Chronosystem	Time, transitions, trauma history, future hopes

Through reflective coloring, symbolism, and guided facilitation, participants using DEMC approach are encouraged to explore the interaction between personal identity and environmental influences while processing emotions, relationships, stressors, resilience, and lived experiences. By combining ecological reflection with expressive arts engagement, DEMC offers a potentially meaningful intervention framework for educational therapy, trauma-informed care, neurodiversity-affirming practice, psychosocial support, and reflective supervision.

The purpose of this paper is to conceptualize DEMC by outlining its theoretical foundations, structural design, intervention process, intended objectives, and potential clinical and educational applications. Furthermore, the paper discusses the possible therapeutic benefits of DEMC, particularly in supporting emotional regulation, ecological self-awareness, symbolic communication, trauma externalization, and identity formation. In doing so, this paper seeks to contribute a theoretically grounded and practice-informed model that may enrich therapeutic and educational interventions through a holistic ecological lens.

2. Research Methodology

The author of this paper has adopted a conceptual research methodology utilizing an integrative literature review and theoretical synthesis approach to develop the proposed *Directed Ecological Mandala Coloring* (DEMC) framework. Conceptual research seeks to advance knowledge through the integration, interpretation, and extension of existing theories and evidence to formulate new models, intervention frameworks, or practice-informed perspectives (Jaakkola, 2020) [12]. In this paper, DEMC is conceptualized through the synthesis of literature drawn from ecological systems theory (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2006) [1, 2], expressive arts therapy (Malchiodi, 2012, 2020) [18, 19], mandala-based interventions (Liu, 2023, Wang 2024) [17, 29], trauma-informed practice (Chia, Wong, & Thang, 2026) [6], neurodiversity-affirming approaches (Dallman, Williams, & Villa, 2022) [8], and psychosocial support frameworks (Williams & Collins, 1999) [30]. The Bronfenbrennerian ecological systems theory serves as the primary theoretical foundation for understanding the interaction between individuals and multilayered environmental systems influencing development and well-being (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2006) [1, 2].

Concurrently, literature on mandala art, expressive therapies, symbolic communication, and trauma-informed interventions informs the therapeutic and reflective processes embedded within DEMC (Kalmanowitz & Ho, 2016^[15]; Malchiodi, 2020^[19]; Skyes, 2021). Through theoretical integration, the paper systematically translates the Bronfenbrennerian ecological systems into six concentric mandala rings (see Figure 1, and also Table 1) to establish a structured expressive intervention framework. Rather than empirically testing intervention outcomes, the author of this paper aims to provide a theoretically grounded, practice-informed model that may guide future clinical applications and empirical investigations across educational, counseling, and therapeutic settings. Conceptual methodologies are particularly appropriate for emerging intervention models where theoretical coherence and practical applicability require initial development prior to formal validation studies (Jaakkola, 2020)^[12].

3. Theoretical Foundation of Directed Ecological Mandala Coloring (DEMC)

As already mentioned at the beginning of this paper, the Directed Ecological Mandala Coloring (DEMC) is a guided expressive intervention that combines ecological reflection with symbolic mandala-based meaning-making. Grounded in interdisciplinary perspectives from ecological systems theory, symbolic psychology, expressive arts therapy, trauma-informed practice, and neurodiversity-affirming approaches, DEMC uses a structured six-ring mandala format to facilitate emotional expression, relational awareness, and reflective exploration of lived experiences (Bronfenbrenner, 1979^[1]; Jung, 1964^[13]; Malchiodi, 2020^[19]; Skyes, 2021). Through the intentional use of colors, symbols, and spatial representation, participants are encouraged to externalize personal and environmental influences in ways that support psychological insight, emotional regulation, and holistic self-understanding (Curry & Kasser, 2005; Henderson, Rosen, & Mascaro, 2007)^[7, 10]. The following subsections outline the major theoretical perspectives informing the conceptual and therapeutic foundations of DEMC.

3.1 Bronfenbrenner's Ecological Systems Theory

Grounded in the Bronfenbrennerian ecological systems theory, the DEMC framework conceptualizes human development as emerging through dynamic and reciprocal interactions between individuals and multiple environmental systems (Bronfenbrenner, 1979)^[1]. From this perspective, human development cannot be fully understood in terms of individual characteristics only, but must instead be examined within nested ecological contexts that shape emotional experiences, identity formation, behaviour, resilience, and psychosocial functioning. These six ecological systems include the intrasystem, microsystem, mesosystem, exosystem, macrosystem, and chronosystem (see Table 1), all of which interact to influence developmental outcomes (Bronfenbrenner & Morris, 2006)^[2]. Within the DEMC model, these systems are translated into six concentric mandala rings that symbolically represent interconnected environmental influences.

The first ring or central circle represents the individual or self-system (also known as Intrasystem), encompassing identity, emotions, neurotype, bodily awareness, strengths,

vulnerabilities, and inner experiences. The second ring symbolizes the Microsystem, referring to immediate environments such as family, peers, teachers, and caregivers. The third ring represents the Mesosystem, involving interactions between microsystems, such as home-school relationships or communication between therapeutic and family settings. The fourth ring corresponds to the Exosystem, which includes indirect influences such as institutional policies, media, parental workplace stress, and healthcare systems. The fifth ring reflects the Macrosystem, representing cultural values, religion, societal expectations, stigma, and national identity. Finally, the outer ring symbolizes the Chronosystem, encompassing life transitions, trauma history, developmental change, migration experiences, illness, recovery journeys, and future aspirations (Bronfenbrenner, 1979; Tudge *et al.*, 2009)^[1, 26]. Through this ecological translation, DEMC enables participants to visually externalize and reflect upon the relational, institutional, cultural, and temporal influences shaping their lives (see Figure 2). This ecological framing supports a holistic and contextual understanding of emotional experiences while encouraging participants to recognize the interconnectedness between personal experiences and environmental systems (Tudge *et al.*, 2009)^[26].

Based on the six Bronfenbrennerian ecosystems, a mandala can be constructed as six concentric rings that symbolically represent the individual and the multiple environmental influences shaping their lived experiences. According to Wang (2024)^[29], a mandala is a symbolic and often circular visual representation used to express wholeness, interconnectedness, balance, and the relationship between the self and the surrounding world. Originating from Sanskrit, the word *mandala* means "circle" or "sacred center" and has been widely used in spiritual, cultural, and therapeutic contexts as a tool for reflection, self-expression, and psychological integration (Jung, 1972)^[14]. In expressive arts and therapeutic practices, mandalas are commonly used to facilitate emotional expression, self-awareness, and healing through structured visual creation (Chia, 2026; Wang, 2024; Xie & Wang, 2021)^[4, 29, 31]. Through the process of drawing and colouring these rings, participants are encouraged to reflect on their emotions, relationships, social environments, cultural contexts, and life experiences in an integrated and visually meaningful way (see Figure 2). For example, a child experiencing emotional trauma may represent fear, sadness, or confusion within the inner self-system ring using dark colours or fragmented imagery. In the microsystem ring, the child may depict conflict within the family or difficulties with peers and teachers. The mesosystem ring may illustrate strained communication between home and school, while the exosystem ring could reflect indirect stressors such as parental unemployment or limited access to mental health support. In the macrosystem ring, the child may portray experiences related to cultural stigma, discrimination, or societal expectations. Finally, the chronosystem ring may symbolize significant life events such as parental divorce, relocation, abuse, loss, or recovery experiences across time. Together, these concentric rings provide a holistic visual representation of how trauma is shaped not only by individual experiences, but also by interconnected ecological systems.

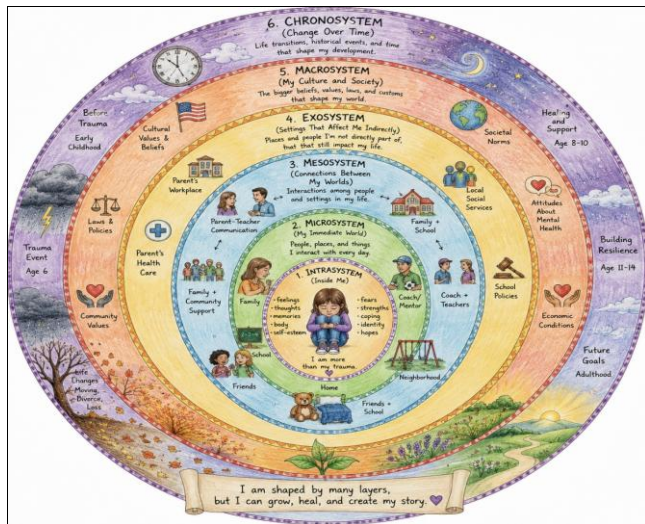


Fig 2: A Bronfenbrennerian Ecological Mandala of Trauma, Healing, and Resilience

3.2 Mandala Theory and Symbolic Meaning-Making

A second theoretical foundation of DEMC is derived from mandala theory and symbolic psychology, particularly the work of Carl Jung, who conceptualized mandalas as symbolic representations of psychological wholeness, integration, and the organization of inner experiences (Jung, 1964) [13]. Mandalas have historically been associated with emotional containment and self-reflection due to their circular and structured form, which may facilitate a sense of order and safety during emotional expression. In therapeutic contexts, mandala-making and coloring have been associated with reduced anxiety, emotional regulation, and symbolic communication, particularly among individuals who experience difficulties articulating emotions verbally (Curry & Kasser, 2005; Henderson *et al.*, 2007) [7, 10]. DEMC extends traditional mandala practices by assigning structured ecological meaning to each concentric ring, thereby transforming coloring from a general mindfulness activity into a guided and reflective intervention that facilitates ecological awareness, emotional processing, and identity exploration.

DEMC may, therefore, be formally defined as a guided expressive arts intervention in which participants intentionally color and symbolize six concentric mandala rings according to Bronfenbrenner's ecological systems theory to facilitate emotional expression, ecological reflection, identity exploration, trauma processing, and relational awareness. The intervention aims to increase ecological self-awareness, facilitate emotional expression, support safe symbolic trauma narration, explore relational dynamics, promote neurodiversity-affirming reflection, strengthen resilience and meaning-making, encourage holistic understanding of environmental influences, and reduce anxiety through structured creative engagement. The structured concentric nature of the mandala may also provide psychological containment, which can be especially beneficial for individuals with trauma histories, emotional dysregulation, or neurodivergent processing styles by offering both symbolic organization and emotional safety (Malchiodi, 2020 [19]; Kalmanowitz & Ho, 2016 [15]; Skyes, 2021).

3.3 Expressive Arts Therapy Framework

Next, DEMC is further informed by expressive arts therapy, which emphasizes the therapeutic value of non-verbal expression, symbolic communication, and creative engagement in facilitating emotional healing and psychological insight. Expressive arts approaches recognize that individuals, particularly children, trauma-affected persons, and neurodivergent individuals, may struggle to communicate complex experiences through conventional verbal methods (Malchiodi, 2020 [19]; Skyes, 2021). Through the use of colors, symbols, shapes, and visual narratives, expressive interventions provide psychologically safer avenues for exploring emotions, relationships, fears, strengths, and lived experiences. In DEMC, the coloring process functions not merely as an artistic activity but as a structured expressive medium through which ecological influences and emotional experiences are externalized and reflected upon. Such therapeutic engagement aligns with strengths-based and participant-centered approaches that emphasize agency, autonomy, and meaning-making (Kalmanowitz & Ho, 2016) [15].

The use of guided symbolism and reflective meaning-making within DEMC aligns closely with expressive arts approaches that emphasize non-verbal communication and emotional processing, particularly among children and individuals who may struggle with direct verbal expression (Malchiodi, 2020 [19]; Kalmanowitz & Ho, 2016 [15]; Skyes, 2021). An example of facilitator guidance within DEMC may include the following instruction: "Each ring represents part of the world that shapes your life. As you color each layer, think about how these people, systems, experiences, and beliefs affect your feelings, identity, and journey. There are no correct answers—only your story represented through color and symbols." This participant-centered approach reinforces autonomy, emotional expression, and meaning-making while acknowledging the complex interplay between individuals and their ecological environments.

Clinically and educationally, DEMC may have broad applications in childhood trauma support, attachment-based therapy, neurodiversity-affirming educational therapy, school counseling, grief interventions, refugee and conflict-affected populations, emotional literacy programs, and reflective supervision for helping professionals. Theoretically informed benefits may include enhanced emotional regulation, reduced anxiety, improved symbolic communication, increased ecological awareness, safer trauma externalization, stronger reflective functioning, and the strengthening of narrative identity (Malchiodi, 2020 [19]; Kalmanowitz & Ho, 2016 [15]; Skyes, 2021).

3.4 Trauma-Informed and Emotional Regulation Perspectives

DEMC is also theoretically supported by trauma-informed perspectives emphasizing emotional safety, psychological containment, and regulated emotional processing. Trauma-informed approaches advocate for interventions that minimize re-traumatization while promoting predictability, autonomy, emotional regulation, and relational safety (Herman, 2015) [11]. The structured concentric organization of the Bronfenbrennerian mandalas may function as a form of symbolic containment, enabling participants to organize

distressing experiences into manageable and visually bounded spaces. Furthermore, preparatory grounding exercises, guided facilitation, and reflective meaning-making embedded within DEMC are consistent with neurobiological understandings of emotional regulation and interpersonal safety (Siegel, 2012) [23]. By encouraging gradual and participant-led reflection, DEMC may support safer trauma externalization and emotional processing, particularly among individuals with histories of adversity, emotional dysregulation, or psychosocial vulnerability.

The DEMC intervention generally follows a structured step-by-step process beginning with a preparation phase in which facilitators provide a six-ring mandala template, coloring materials, and a calm psychologically safe environment. Reflection prompts or guiding questions may also be introduced to emphasize that there are no “right” or “wrong” colors and that symbolic expression remains personal and participant-led. This is followed by grounding and emotional check-in activities, such as brief breathing exercises, emotional rating scales, and reflective prompts regarding current emotional states and influential environments. Such preparatory practices may help establish emotional readiness and psychological safety, especially among trauma-affected individuals (Siegel, 2012) [23].

Participants then begin coloring the center circle representing the self-system, reflecting upon identity, emotions, fears, strengths, neurodivergent traits, and hopes. Facilitators may encourage reflection through prompts such as “Who am I?” or “What colors represent my inner world?” Subsequently, participants color the microsystem ring to explore immediate relationships with family, teachers, caregivers, and peers, reflecting on sources of emotional safety, support, stress, or confusion. The mesosystem ring encourages exploration of interactions between different environments, such as home–school relationships or family-therapy communication, allowing participants to visually represent harmony, fragmentation, or tension between systems. The exosystem ring facilitates reflection on indirect environmental influences, including institutional systems, media, healthcare, or caregiver workplace stress, while the macrosystem ring focuses on societal and cultural beliefs, religion, social expectations, stigma, and identity formation. Finally, the chronosystem ring allows participants to reflect on major life transitions, trauma histories, developmental changes, migration experiences, illness, recovery, and future aspirations through symbolic expression (Bronfenbrenner, 1979 [1]; Malchiodi, 2020 [19]; Skyes, 2021).

Following completion of the Bronfenbrennerian mandala, participants engage in reflection and meaning-making, during which facilitators gently explore the emotional significance of colors, symbols, and patterns in a non-judgmental manner. Questions such as “Which ring was hardest to color?”, “Which ring feels safest?”, or “Where do you notice balance or imbalance?” may be used to facilitate insight while maintaining participant autonomy. The intervention concludes with emotional regulation and closure activities, including grounding exercises, positive affirmations, discussion of strengths and coping resources, and optional journaling, verbal sharing, or titling of the completed mandala. Such closure practices are important for

emotional containment and integration, particularly in trauma-informed interventions (Herman, 2015; Siegel, 2012) [11, 23].

3.5 Neurodiversity-Affirming Perspective

A neurodiversity-affirming perspective also informs DEMC by recognizing that emotional expression, communication, sensory processing, and meaning-making vary across neurotypes. Rather than conceptualizing neurodivergence through a deficit-oriented lens, neurodiversity-affirming approaches emphasize strengths, autonomy, dignity, and contextual understanding (Dallman, Williams, & Villa, 2022) [8]. Structured visual and symbolic interventions may be especially meaningful for neurodivergent individuals who prefer visual-spatial processing, symbolic representation, or non-verbal communication over direct verbal disclosure. DEMC therefore provides flexible opportunities for self-expression without requiring rigid linguistic explanations, allowing participants to communicate emotions and lived experiences in personally meaningful ways while respecting individual differences in processing and expression (Malchiodi, 2020 [19]; Skyes, 2021).

Within DEMC, participant autonomy and flexibility are emphasized throughout the intervention process. Individuals are encouraged to choose personally meaningful colors, symbols, and patterns without fear of evaluation or correction, reinforcing dignity and self-determination. The multimodal and non-verbal structure of the intervention may be especially supportive for neurodivergent individuals who experience difficulties with conventional verbal communication, emotional labeling, or socially prescribed forms of expression (Malchiodi, 2012; Moon, 2016) [18, 21]. By allowing symbolic and sensory-based forms of communication, DEMC supports inclusive and affirming therapeutic engagement while recognizing diverse ways of processing emotions, relationships, and environmental experiences. Such approaches are consistent with neurodiversity-affirming and expressive arts practices that value individual strengths, sensory preferences, and alternative modes of emotional expression (Kapp, 2020; Van dan Berg, 2016) [16, 27].

4. Step-by-Step Process of Directed Ecological Mandala Coloring (DEMC)

The following Table 2 outlines the step-by-step DEMC process: a structured expressive arts and reflective intervention grounded in the Bronfenbrennerian ecological systems framework. The process guides participants through six concentric mandala rings representing interconnected ecological systems that influence human development and emotional experiences. Through guided coloring, reflection, and meaning-making activities, participants are encouraged to explore their inner experiences, relationships, environmental influences, cultural contexts, and life transitions in a safe, non-judgmental, and visually symbolic manner. The structured phases also support emotional awareness, self-expression, ecological reflection, and emotional regulation (Bronfenbrenner, 1979; Malchiodi, 2012) [1, 18].

Table 2: The Step-by-Step Process of DEMC

Step	Process Stage	Focus and Activities	Reflection Prompts
Step 1	Preparation Phase	Prepare a six-ring Bronfenbrennerian mandala template, coloring materials, a calm and psychologically safe environment, and reflection prompts or guiding questions. The facilitator explains that there are no “right” or “wrong” colors, symbolism is personal, and participants may choose abstract patterns, colors, or images.	—
Step 2	Grounding and Emotional Check-In	Begin with a brief breathing exercise, emotional rating scale, and reflective check-in to establish emotional readiness before coloring.	“How do you feel today?” “What environments influence you most currently?”
Step 3	Coloring the Center Circle (Self-System)	Participants explore emotions, identity, strengths, fears, neurodivergent traits, and hopes through colors, symbols, or imagery within the center circle.	“Who am I?” “What colors represent my inner world?” “What part of me feels strongest or most vulnerable?”
Step 4	Coloring the Microsystem Ring	This ring represents immediate relationships and environments such as family, teachers, friends, and caregivers.	“Who makes me feel safe?” “Who causes stress?” “Which relationships bring comfort or confusion?”
Step 5	Coloring the Mesosystem Ring	Participants reflect on interactions between environments, including school-home relationships, therapy-family communication, and peer-family interactions. Patterns may symbolize harmony, fragmentation, or tension.	“Do my environments work together or conflict?” “What connections help or hurt me?”
Step 6	Coloring the Exosystem Ring	Participants consider indirect influences such as community services, healthcare systems, media, workplace stress affecting caregivers, and educational systems.	“What systems affect my life indirectly?” “What invisible pressures exist around me?”
Step 7	Coloring the Macrosystem Ring	This ring explores cultural beliefs, religion, social expectations, stigma, national identity, and personal or societal values.	“What societal expectations affect me?” “Which cultural beliefs support or hurt me?”
Step 8	Coloring the Chronosystem Ring	The outer ring reflects life transitions, trauma history, developmental change, migration experiences, illness or recovery journeys, and future aspirations.	“What major life events shaped me?” “What future am I moving toward?”
Step 9	Reflection and Meaning-Making	Participants describe the colors, symbols, and patterns used in the Bronfenbrennerian mandala. The facilitator gently explores emotional meanings while maintaining a non-judgmental and participant-led approach.	“Which ring was hardest to color?” “Which ring feels safest?” “Where do you see balance or imbalance?”
Step 10	Closure and Emotional Regulation	Conclude with grounding exercises, positive affirmations, and discussions of strengths and coping resources. Participants may optionally title their Bronfenbrennerian mandala, journal reflections, or verbally share insights.	—

DEMC has diverse clinical and educational applications across therapeutic, counselling, and psychosocial settings. The Bronfenbrennerian framework may be particularly useful in supporting children experiencing trauma, attachment difficulties, grief, and emotional dysregulation by providing a safe and symbolic medium for emotional expression and reflection. DEMC may also be applied within neurodiversity-affirming educational therapy to support self-awareness, emotional literacy, and identity development among neurodivergent individuals. In addition, the approach may benefit refugee and conflict-affected children whose experiences are shaped by displacement, loss, and complex ecological stressors. Within educational contexts, DEMC can be integrated into school counselling and emotional literacy programmes to facilitate emotional communication, resilience-building, and relational understanding. The framework may further support reflective supervision for educators, counsellors, therapists, and helping professionals by encouraging awareness of the ecological and relational factors influencing professional practice and emotional wellbeing (Bronfenbrenner, 1979; Malchiodi, 2012) [1, 18].

Limitations of Directed Ecological Mandala Coloring

Despite its potential therapeutic and educational value, DEMC has several limitations that should be considered in practice and research. As a highly subjective and symbolic intervention, the interpretation of colors, patterns, and imagery may vary significantly across individuals, cultures, developmental stages, and contexts. This subjectivity may increase the risk of overinterpretation if facilitators impose meanings that are not participant-generated. To reduce the subjectivity of DEMC interpretation, facilitators should adopt a participant-led and non-impositional approach in which meanings are derived primarily from the participant’s own explanations, narratives, and reflections rather than external assumptions. The use of reflective questioning, collaborative dialogue, and trauma-informed practice may further enhance the reliability, safety, and contextual sensitivity of interpretation (Malchiodi, 2012; Moon, 2016) [18, 21].

Moreover, DEMC also relies heavily on participants’ willingness and capacity for self-expression, reflection, and symbolic communication, which may be challenging for individuals with severe cognitive, emotional,

communicative, or sensory difficulties. In addition, emotional exploration through mandala work may evoke distressing memories, trauma responses, or emotional dysregulation, particularly among vulnerable populations, thereby requiring facilitators to possess adequate trauma-informed and therapeutic skills (Malchiodi, 2012) ^[18]. To reduce the risk of emotional overwhelm, facilitators should establish psychologically safe environments, incorporate grounding and emotional regulation strategies, and allow participants to control the pace and depth of disclosure throughout the activity. The use of supportive check-ins, non-judgmental facilitation, and participant-led reflection may further help individuals feel emotionally contained and supported during the mandala process (Moon, 2016; van der Kolk, 2014) ^[21, 28].

Another limitation is the relatively limited empirical evidence specifically examining DEMC as a distinct intervention model. Although the framework draws upon established foundations in ecological systems theory (Bronfenbrenner, 1979) ^[1], expressive arts therapy (Malchiodi, 2012) ^[18], and mandala-based interventions (Xie & Wang, 2021) ^[31], further empirical research is needed to evaluate its effectiveness, reliability, cultural applicability, and long-term therapeutic outcomes across diverse populations. Existing literature (e.g., Chia, Wong, & Thang, 2026; Liu, 2023; Wang, 2024) ^[6, 17, 29] on expressive arts and mandala-based interventions has shown promising outcomes in supporting emotional expression, stress reduction, and psychological healing. However, more rigorous, evidence-based studies are still needed to establish clinical validity and generalizability across settings and populations (Henderson, Rosen, & Mascaro, 2007; Slayton *et al.*, 2010) ^[10, 24]. Cultural factors may also influence how participants perceive symbolism, emotional expression, family relationships, and ecological influences, meaning that the framework may require adaptation to remain culturally responsive and contextually meaningful. Furthermore, DEMC should not be viewed as a standalone diagnostic or treatment tool, but rather as a complementary reflective and expressive approach that may support broader therapeutic, educational, or psychosocial interventions (Bronfenbrenner, 1979; Henderson, Rosen, & Mascaro, 2007) ^[1, 10].

5. Conclusion

Directed Ecological Mandala Coloring (DEMC) represents a theoretically grounded and practice-oriented intervention that brings together ecological systems theory and expressive arts practice in a structured and intentional manner. By integrating Bronfenbrenner's ecological model into the concentric symbolic form of mandala coloring, DEMC provides individuals with an opportunity to visually and emotionally explore the multiple environmental systems shaping their identity, emotions, relationships, resilience, and lived experiences. Unlike conventional mandala coloring approaches that may emphasize relaxation or spontaneous creativity alone, DEMC offers a guided framework that encourages ecological reflection, emotional expression, and meaning-making across interconnected layers of influence (Bronfenbrenner, 1979 ^[1]; Malchiodi, 2020 ^[19]; Skyes, 2021).

The proposed intervention demonstrates potential relevance across diverse therapeutic, educational, and psychosocial contexts, including childhood trauma support, neurodiversity-affirming educational therapy, school

counseling, grief interventions, attachment-based practices, and support for refugee or conflict-affected populations. Through the intentional use of symbols, colors, and guided reflection, DEMC may enable safer forms of emotional communication and trauma externalization, particularly among individuals who experience difficulties articulating complex emotions verbally. Furthermore, the structured concentric organization of the mandala may provide psychological containment and predictability, factors that are particularly valuable for individuals experiencing emotional dysregulation, trauma-related distress, or neurodivergent processing differences (Kalmanowitz & Ho, 2016; Siegel, 2012) ^[15, 23].

Importantly, DEMC reflects a holistic understanding of human development by acknowledging that emotional experiences and behavioral outcomes are not solely products of individual characteristics but are continuously shaped by interactions within relational, institutional, sociocultural, and temporal systems. Such a perspective aligns closely with contemporary strengths-based, trauma-informed, and neurodiversity-affirming approaches that emphasize contextual understanding, dignity, participation, and relational safety (Bronfenbrenner & Morris, 2006 ^[2]; Malchiodi, 2020 ^[19]; Skyes, 2021). As a proposed intervention model, DEMC also opens opportunities for future empirical research to evaluate its effectiveness, adaptability, and outcomes across different age groups, neurotypes, cultural contexts, and therapeutic settings.

In conclusion, DEMC may offer an innovative and meaningful contribution to expressive intervention practices by transforming abstract ecological influences into a tangible, reflective, and emotionally accessible visual process. Through structured creative engagement, DEMC has the potential to support emotional regulation, identity exploration, resilience-building, ecological self-awareness, and therapeutic meaning-making while honoring the complex interplay between individuals and the environments that shape their developmental journeys.

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7. Conflict of interest

The author declares no conflict of interest.

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